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Technical Letter
No. 1110-3-481

23 May 1997

Construction
CONTRACTOR SUBMITTAL PROCEDURES

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Engineering and Design
CONTAINMENT AND DISPOSAL OF
AQUEOUS FILM-FORMING FOAM SOLUTION

1. Purpose. This letter provides design guidance for containment and disposal of aqueous film-forming foam (AFFF) discharges from AFFF fire extinguishing systems.
2. Applicability. This letter applies to all HQUSACE elements and USACE commands having military construction and design responsibility. This ETL has been coordinated with the Air Force.
3. Background.
 - a. AFFF fire suppression systems are typically provided in aircraft hangars. AFFF systems have superior fire extinguishing capability and can effectively control a flammable or combustible liquid fire. This type of protection is necessary to protect valuable, mission-essential aircraft and hangar facilities.
 - b. A concern of AFFF systems is the discharge of AFFF foam solution. In large volumes, AFFF foam can be harmful to the environment. AFFF solution should not be allowed to flow untreated into the ecosystem, or into the sewage systems in large quantities. The primary concern is discharge from unwanted activations and from periodic testing.
 - c. Except for this technical letter, there is little information on this subject and no specific design guidance that provide a reasonable approach to handling AFFF discharges.
4. Guidance.
 - a. Containment systems should be provided for most fixed AFFF fire extinguishing systems. Exceptions are listed in the appendix. Containment systems should be designed to contain the most probable worst case AFFF discharge. The most probable worst case AFFF discharge is defined as the maximum discharge likely to occur in a non-catastrophic event. The most probable worst case is different for open fire extinguishing systems and for closed fire extinguishing systems.
 - b. AFFF discharges associated with major fires are not considered the most probable worst case for two reasons. First, a major fire would be considered a catastrophic event. Second, an occurrence of a major fire in a well protected hangar is not

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considered a probable event. In the event of a fire, a AFFF fire suppression system would control the fire and would not produce significant amounts of AFFF.

c. It should be noted that significantly less AFFF discharge would be produced in a protected hangar than that produced if a fire occurred in an unprotected hangar. To fight a fire in an unprotected hangar, significantly larger amount of AFFF would be applied by the fire department hose streams. A fire in an unprotected hangar could cause considerable environmental harm.

d. Open Fire Extinguishing Systems. Open systems are oscillating and fixed nozzle systems, as well as deluge sprinkler systems which discharge foam by activation of detectors or manual release stations. These systems have open nozzles and sprinkler heads. The worst case for an open system is an accidental discharge, and the fire department responding and shutting off the system. Containment will be designed to hold a minimum of 10-minutes of full system flow. This capacity should be increased if longer fire department response times are anticipated.

e. Closed Fire Extinguishing Systems. Closed systems are systems which have no open orifices. In order for these systems to discharge, there must be a fire that produces sufficient heat to fuse a sprinkler head. Such systems are overhead wet-pipe sprinkler and pre-action sprinkler systems. For these systems, the worst case is defined as the discharge that occurs from periodic testing. Containment systems will be designed to hold 3-minute test flows of each system.


f. Detailed information on AFFF and more specific design guidance are provided in Appendix A.

5. Action. The guidance included in this technical letter and in Appendix A will be used for the planning, design and construction of new facilities with AFFF fire extinguishing system protection.

6. Implementation. This technical letter will have immediate application, as defined in paragraph c, ER 1110-345-100.

FOR THE COMMANDER:

1 Appendix
App A - Containment
and Disposal of
Aqueous Film-Forming
Foam AFFF Solution


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